IESO_MAN_0076

MARKET MANUAL

Independent Electricity System Operator

## Market Manual 9: Day-Ahead Commitment Process

# Part 9.1: Submitting Registration Data for the DACP

**Issue 2.0**



*This document provides guidance to Market Participants on the submission of registration data for the Day-Ahead Commitment Process.*

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## Document Change History

| Issue | Reason for Issue | Date |
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| 1.0 | Issued in advance of Baseline 26.1 for the implementation of EDAC. | October 12, 2011 |
| 2.0 | Issued in advance of Baseline 33.1 to update IESO logo. | March 31, 2015 |

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# Table of Changes

| Reference (Paragraph and Section) | Description of Change |
|---|---|
| Entire Document | New market manual created as a result of the Enhanced Day-Ahead Commitment (EDAC) project.<br>The existing IESO_MAN_0041 – "Market Manual 9: Day-Ahead Commitment Process Operations and Settlements" market manual has been broken into six parts (i.e., Part 9.0 through Part 9.5).<br>This market manual represents Part 9.1 of "Market Manual 9: Day-Ahead Commitment Process" and reflects all of the changes to the Day-Ahead Commitment Process (DACP) resulting from the EDAC project. |

# 1. Market Manuals

The *market manuals* consolidate the market procedures and associated forms, standards, and policies that define certain elements relating to the operation of the *IESO-administered markets*. Market procedures provide more detailed descriptions of the requirements for various activities than is specified in the *market rules*. Where there is a discrepancy between the requirements in a document within a *market manual* and the *market rules*, the *market rules* shall prevail. Standards and policies appended to, or referenced in, these procedures provide a supporting framework.

**– End of Section –**

# 2. About this Manual

This document, "Part 9.1: Submitting Registration Data for the Day-Ahead Commitment Process", is part of *Market Manual* Volume 9 (a.k.a., the "Day-Ahead Commitment Process Manual").

The "Day-Ahead Commitment Process Manual" is the collection of documents related to the Day-Ahead Commitment Process (DACP), and consists of the following document set**:**

**Table 2-1: Table of Contents—Market Manual 9**

| Document ID | Part No. | Name of Procedure Document |
|---|---|---|
| IESO_MAN_0041 | 9.0 | Day-Ahead Commitment Process Overview |
| IESO_MAN_0076 | 9.1 | Submitting Registration Data for the Day-Ahead Commitment Process |
| IESO_MAN_0077 | 9.2 | Submitting Operational and Market Data for the Day-Ahead Commitment Process |
| IESO_MAN_0078 | 9.3 | Operation of the Day-Ahead Commitment Process |
| IESO_MAN_0079 | 9.4 | Real-Time Integration of the Day-Ahead Commitment Process |
| IESO_MAN_0080 | 9.5 | Settlement for the Day-Ahead Commitment Process |

## 2.1 Conventions

The *market manual* standard conventions are as defined in "Part 9.0: Day-Ahead Commitment Process Overview", section '2.4 Conventions'.

**– End of Section –**

# 3. Introduction

## 3.1 Purpose

This *market manual* is intended as a guide for *market participants* when submitting registration data to the *IESO* to participate in the Day-Ahead Commitment Process (DACP). The manual provides a summary of steps and interfaces between the *market participants* and the *IESO* for submitting DACP registration data. The procedural workflows and steps described in this document:

- Define the *market participant* and *IESO* obligations for submitting registration data for the DACP as set out in the *market rules* and applicable *IESO* policies and standards.
- Serve as a roadmap for *market participants* and the *IESO* when submitting DACP registration data.

## 3.2 Scope

To participate in the DACP, you must ensure that you have been authorized to participate in the *IESO-administered markets* and that the physical *facilities* that you intend to use to participate in the DACP have been registered with us to participate in the *real-time markets*. The process for the authorization and registration of *facilities* to participate in the *IESO-administered markets* is not within the scope of this manual and is described in "Market Manual 1: Market Entry, Maintenance & Exit".

This *market manual* describes the process for those *generation facilities* that need to provide additional registration data for use in the DACP. The following *generation facilities* must provide the registration information identified in this manual:

- Dispatchable *generation facilities*
    - *Quick start facilities*
    - Non *quick start facilities*, including combined cycle plant *generation facilities*
- *Transitional scheduling generators* (TSG), *intermittent generators* and, *self-scheduling generation facilities*
- *Dispatchable loads*

## 3.3 Contact Information

General inquiries regarding the role of the *IESO*, becoming a *market participant*, submitting DACP registration data, or *market participant* related questions should be directed to the IESO Customer Relations Department. Contact information is available from the "Contact Us" link in the *IESO* web site (www.ieso.ca).

During the participant authorization and registration process, *applicants* will work with an *IESO* Registration & Compliance Support Technical Officer, and individual contact information will be supplied to the *applicant* once the process has been initiated. *IESO* Registration & Compliance Support staff may be contacted at market.entry@ieso.ca.

In addition to the required contacts identified on the "Application for Authorization to Participate", *applicants* have the option to identify a range of contacts within their organization that address specific areas of their business operations. Additional contact information can be supplied to the *IESO* on IMO-FORM-1238, "Market Participant Contacts".

Forms that *applicants* must complete for the DACP process, as well as the accompanying supporting documentation, can be submitted to the *IESO* via mail or courier by using the appropriate address provided on the *IESO*'s web site or on the form. These forms are generally available for download on the *IESO*'s web site and are listed in Appendix A.

Correspondence that is sent to the *IESO* related to the Market Entry portion of this procedure shall be identified with the subject: **Market Entry**

**– End of Section –**

# 4. Overview of Submission of Registration Data

The information in this section is provided for context purposes only and highlights the main actions of the procedure as set out in Section 5.

The DACP registration process collects specific operational information to determine:

- Your resource's day-ahead commitments and schedules while respecting the resource technical data
- Your eligible energy limited resource (EELR) status
- Your eligibility for Day-Ahead Production Cost Guarantee (DA-PCG); and
- Your DA-PCG *settlement amounts*

To participate in the Day-Ahead Commitment Process (DACP), you must ensure that you are authorized to participate in the *IESO-administered markets*, and that the physical *facilities* that you intend to use to participate in the DACP have been registered with us to participate in the *real-time markets*. There are specific registration requirements for dispatchable *generation facilities* participating in the DACP. All other *facilities* (load facilities, *boundary entities* and non-dispatchable generators) have no new registration requirements. In addition, you must also indicate to the *IESO* whether you intend to submit three-part *offers*.

## 4.1 DACP Registration Forms

If you operate *generation facilities*, you are required to submit a number of *IESO* Forms in order to capture the relevant DACP registration information. The forms include:

- IMO_FORM_1552 – Real-Time Generation Cost Guarantee and Day-Ahead Production Cost Guarantee Data Form
- IMO_FORM_1181 – Facility Profile
- IESO_FORM_1702 – Combined Cycle Plant Form
- IMO-FORM-1004 - Generation Facilities

If you intend to submit three-part *offers* as part of your *dispatch data* for the DACP, you must complete IESO-FORM-1721 "Implementation of Three-Part Offers"

The registration information is processed through the *IESO* registration process during *business days*. If you submit the completed documentation to support your data, this information becomes effective within six *business days* of receipt.

### 4.1.1 IMO_FORM_1552 – Real-Time Generation Cost Guarantee and Day-Ahead Production Cost Guarantee Form

Non *quick start* dispatchable *generation facilities* must complete this form to provide us with the following registered technical data (RTD) for each of your resources:

- *Minimum loading point* (including the steam turbine *minimum loading points* for n-on-1 combustion turbine to steam turbine configuration) (MLP)
- *Minimum run-time*
- *Minimum generation block run-time*

The *minimum loading point* of a steam turbine (ST) at a combined cycle plant may differ depending on the number of combustion turbines (CT) that obtain a schedule from the DACP. For registration purposes, *n*-1 additional ST MLPs are required for all combined cycle configurations above the *MLP* submitted for a 1 CT on 1 ST configuration; *n* is equal to the number of combustion turbines at the combined cycle plant. Each value must reflect the technical capability of the *generation unit*.

This RTD is shared with the Real-Time Generation Cost Guarantee (RT-GCG) program and the Multiple Interval Optimization (MIO) sequence in real-time. Therefore, on the same form, you must also indicate whether you want to participate in the Real-Time Generation Cost Guarantee (RT-GCG).

The registered values of the *minimum loading point* and *minimum generation block run-time* that you provide are assumed to be relatively static. They represent the baseline that we will use to validate changes through the day-ahead daily generation data submissions. Submitted Daily Generation Data (DGD) values are used to schedule non *quick start* resources, determine the Production Cost Guarantee (DA-PCG) commitment actions and to calculate the DA-PCG. You will be able to view the registered values of your *minimum loading point*, *minimum run-time*, and *minimum generation block run-time* through the IESO registration system.

### 4.1.2 IMO_FORM_1181 – Facility Profile

All *generation facilities* and *dispatchable load facilities* must complete when registering physical *facilities* (for details refer to MDP_PRO_0016 Market Manual 1, Part 1.2 Facility Registration Maintenance Deregistration). However, all dispatchable g*eneration facilities* must complete this form to provide us with the following DACP specific registration data:

- *Elapsed time to dispatch* (ETD)
- *Daily cascading hydroelectric dependency* (DCHD)
- *Quick Start facilities*
- Cascading hydroelectric dependent generation resource

### 4.1.3 IESO_FORM_1702 – Combined Cycle Plant Form

You must complete this form if you have *generation facilities* that are part of a combined cycle plant (CTs and STs) that:

- Have already been registered individually
- Are part of the same *registered facility*
- Have a resource bid type of dispatchable
- Are not a part of a physically aggregated resource
- Are under the operational control of a single *market participant*
- Are assessed a settlement under a single *metered market participant*

The form will provide us with the following DACP-specific registration data:

- Physical CT and ST Resource Names and Resource IDs
- Declaration to use *pseudo unit* model
- Steam Turbine Percentage Share of Pseudo Unit
- Steam Turbine Power Augmentation Amount (e.g., duct firing capacity)

### 4.1.4 IESO_FORM_1721 – Implementation of Three-Part Offers

This form is used to inform us of your intention to submit three-part *offers* for the DACP. This declaration will be used by *IESO* systems to determine the version of the Market Participant Interface (MPI) and Application Programmers Interface (API) *offer* template file that they will use to submit and retrieve *dispatch data*.

This form contains the Three-Part Offer Eligibility Declaration.

### 4.1.5 IMO_FORM_1004 – Generation Facilities

All *generation facilities* must complete this form to provide us with the following DACP specific registration data:

- Primary Fuel Type[1]
- Secondary Fuel Types

**– End of Section –**

[1] A list of possible fuel types can be found on IMO_FORM_1111 – NERC Fields-Valid Codes

# 5. Procedures for Submitting DACP Registration Data

This section provides detailed procedures for submitting registration data for the DACP. The following procedures are described in this section:

- Submit DACP Registration Data
- Procedure 5.2– Submit Combined Cycle Plant and Pseudo Unit Registration Data

The applicability of these procedures to specific resources is shown in Table 5-1:

**Table 5-1: Applicability of Procedures**

| Resource Type | 5.1: Submit DACP Registration Data | 5.2: Submit CCP and PSU Data |
|---|---|---|
| **Non Quick Start** | X | X[2] |
| **Pseudo Unit** | X | X |
| **Quick Start** | X | |
| **Transitional Scheduling (TS); Intermittent; Self Scheduling** | X | |
| **Dispatchable Load** | X | |

## 5.1 Submit DACP Registration Data

The Day-Ahead Calculation Engine (DACE) respects the technical characteristics of generation resources. Static technical characteristics are registered through Market Entry. Variable technical characteristics are recorded as daily generation data (DGD) and may be overwritten daily if equipment or regulatory conditions warrant. 'Table 5-2: Registration Requirements to support DACP, by Resource Type' shows the registration data elements you must provide prior to participating in the DACP, as determined by resource or *facility* type.

[2] Required for combined cycle plants

**Table 5-2: Registration Requirements to support DACP, by Resource Type**

| Data Description | Unit of Measure | Resource/Facility Type | | | | | |
|---|---|---|---|---|---|---|---|
| | | Non Quick-start | Combined Cycle Plant | Pseudo Units | Quick Start | Hydroelectric | Dispatchable Load |
| Minimum Loading Point | MW | X | | | | | |
| Minimum Generation Block Run Time | Hours | X | | | | | |
| Elapsed Time to Dispatch | Minutes | X | | | X | | |
| Daily Cascading Hydroelectric Dependency | Yes or No | | | | | X[3] | |
| Quick Start Facilities | Yes or No | X | X | X | X | X | |
| CT and ST Relationship | Relationship | | X | X | | | |
| ST Minimum Loading Point[4] | MW | | X | X | | | |
| ST Share (Applicable to each CT) | % | | | X | | | |
| ST Duct Firing Capacity | MW | | | X | | | |
| Pseudo Unit Declaration | Yes or No | | X | | | | |
| Primary Fuel Type | Type | X | X | X | X | X | |
| Secondary Fuel Type | Type | X | X | X | X | X | |
| Three-Part Offer Requirement | Yes or No | X | X | X | | | |

[3] DCHD submission is only required for hydroelectric facilities with a cascading dependency as specified in section 5.1.4

[4] Unlike the other data elements in this table, which have only one daily value associated with them, the ST MLP has multiple values – one for each CT configuration at the combined cycle plant (1-on-1 MLP, 2-on-1 MLP, 3-on-1 MLP, etc.).

Figure 5-1 shows an overview of the dispatchable generator technical data required for the enhanced DACP.

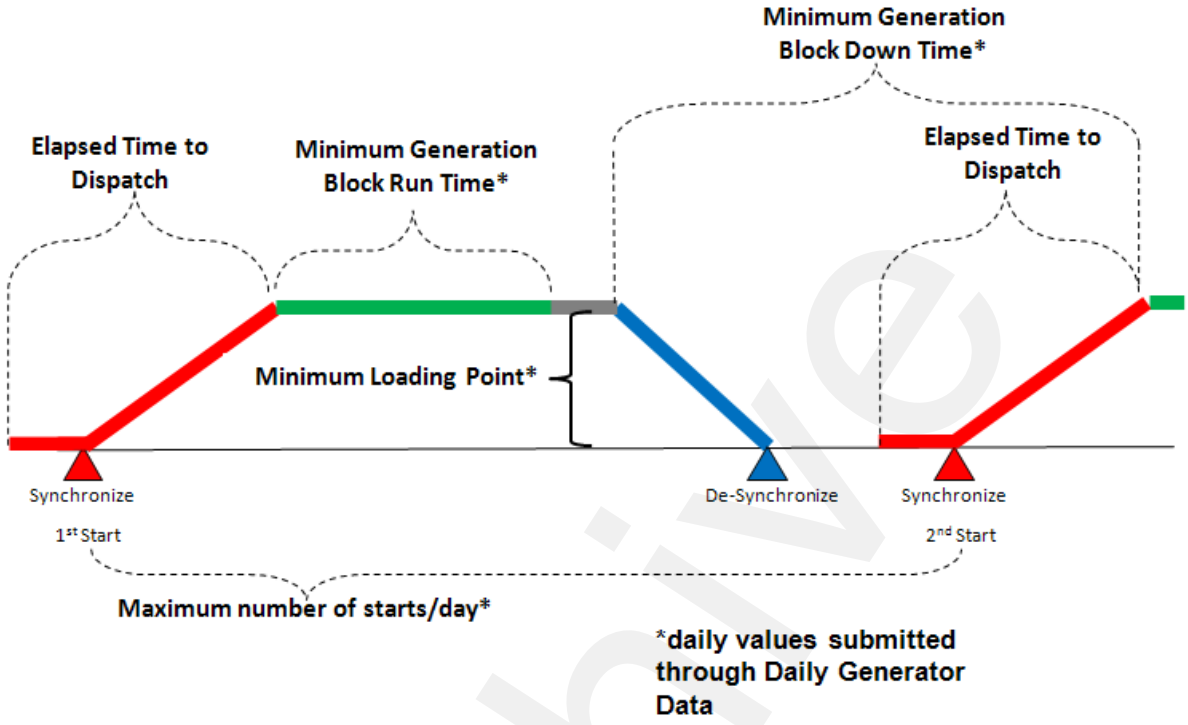



**Figure 5-1: Dispatchable Generator Technical Data**

## 5.1.1 Minimum Loading Point

The *Market Rules* define the *minimum loading point* (*MLP*) as the minimum output of *energy* specified by the *market participant* that can be produced by a *generation facility* under stable conditions without ignition support.

Only dispatchable non *quick start generation facilities* can submit a *minimum loading point* and its value must reflect the technical capability of the *generation facility*.

For registration purposes, you must submit a single value of *minimum loading point* for each dispatchable not *quick start generation facility*. If your *generation facility* is a steam turbine at a combined cycle plant you may submit multiple *minimum loading points* as described in section 5.2 of this document.

The registered value of the *minimum loading point* that you provide is assumed to be relatively static and represents the baseline that we will use to validate changes through the day-ahead daily generator data submissions. Also, during registration we will use the registered *MLP* in determining DA-PCG eligibility.

We will validate the data based on the following validation rules:

- Resource is a dispatchable *generation facility*
- Resource must not be a *quick start generation facility*
- Number format xxxx – unit is MW
- 0 =< *MLP* =< Maximum generator capacity (MGC)

### 5.1.2 Minimum Generation Block Run Time

*Market Rules* define *minimum generation block run time* (MGBRT) as the number of hours, specified by the *market participant*, that a *generation facility* must be operating at *minimum loading point* in accordance with the technical requirements of the *facility*.

Only dispatchable non *quick start generation facilities* can submit a *minimum generation block run time*.

For registration purposes, you must submit a single value of MGBRT for each dispatchable non *quick start generation facility*. The value must reflect the technical capability of the *generation facility*.

The registered value of the *MGBRT* that you provide is assumed to be relatively static and represents the baseline that we will use to validate changes through the day-ahead daily generator data submissions. Also, during registration we will use the registered *MGBRT* in determining DA-PCG eligibility.

We will validate the data based on the following validation rules:

- Resource is a dispatchable *generation facility*
- Resource must not be a *quick start generation facility*
- Number format xx – unit is hours
- 0 =< MGBRT =< 24

### 5.1.3 Elapsed Time to Dispatch

*Elapsed time to dispatch* (ETD) is the minimum amount of time, in minutes, between the time when a dispatchable generator initiates its start-up sequence and the time when it can respond to *IESO dispatch* signals under a hot start. For a non *quick start generation unit*, this means that the *generator* has reached *MLP*. The ETD must be submitted by all *dispatchable generators* and must reflect the technical capability of the *resource*.

During registration we will only use ETD in determining DA-PCG eligibility. *A dispatchable generator* that submits an *elapsed time to dispatch* value that is equal to or less than 60 minutes will not be DA-PCG eligible.

We will validate the data based on the following validation rules:

- Resource is a dispatchable *generation unit* for ETD to be used
- Number format xxxx – unit is minutes
- Must be a non-negative integer

### 5.1.4 Daily Cascading Hydroelectric Dependency

A dispatchable hydroelectric *generation facility* has a daily cascading hydroelectric dependency (DCHD) if the *facility* has a Minimum Hydraulic Time Lag[5] of less than 24 hours to or from an adjacent cascading hydroelectric generation facility that is controlled by the same *registered market participant*.

The DCHD is used to determine whether a *generation unit* is an Eligible Energy Limited Resource (EELR). Once defined as an EELR, a *generation unit* is deemed eligible to resubmit *dispatch data* after the initial run of the DACE, provided that a Daily Energy Limit (DEL) was submitted as part of the day-ahead *offer*. For registration purposes, you must submit the following information for each dispatchable hydroelectric *generation unit*:

- A self-declaration that the *generation unit* has a DCHD
- The Resource Name and Resource ID of the cascading hydroelectric dependent *generation facility* (when a DCHD is declared)

We will validate the data based on the following validation rules:

- Resource is a dispatchable *generation facility*
- Registered Resource Primary Fuel Type is 'WATER' (i.e. the *generation facility* is a hydroelectric *facility*)
- Cascading hydroelectric dependent *generation facility* is controlled by the same *registered market participant*

The Daily Cascading Hydroelectric Dependency is not recorded in the *IESO* registration solution.



[5] Minimum Hydraulic Time Lag is the minimum amount of time, in hours (rounded down to the nearest whole hour), that is required for water to travel to, or from, an adjacent hydroelectric *generation facility* on the same water system.

### 5.1.5 Quick Start Flag

For registration purposes, you must submit a *Quick Start Facility* declaration for each dispatchable *generation facility*. The declaration is mandatory for all dispatchable *generation facility* and must reflect the technical capability of the *facility*. We will use this information to determine which *generation facilities* are set as quick start in the SCADA model (these generation resources are eligible to provide *ten minute reserve* when their breaker is open).

Determine if your dispatchable *generation facility* is a *Quick Start Facility* based on the definition in the *market rules*.We will validate the data based on the following validation rules:

- Resource is a dispatchable *generation facility*
- Operating characteristics of the dispatchable *generation facility* specified by the Market Participant

We will record the *Quick Start Facility* flag along with a start date in order to handle time dependent revisions based on the following rules:

- If the dispatchable *generation facility* is deemed to be non *quick start facility*
  *Quick Start Facility* Flag = NO
- If the dispatchable *generation facility* is deemed to be a *quick start facility*
  *Quick Start Facility* Flag = YES

### 5.1.6 Generator Primary and Secondary Fuel Type

We will record the Generator Primary and Secondary Fuel Type for reference by downstream processes.

It is mandatory to submit a single Generator Primary Fuel Type for each *generation unit*, for registration purposes. You also have the option to submit a single Generator Secondary Fuel Type. The fuel type must reflect the technical capability of the *generation unit*, and is prohibited if the resource is not a generation resource.

Enter the primary and secondary fuel types on ‘Form 1004 – Generation Facilities’. The fuel types can be selected from the list of fuel types on ‘Form 1111 – NERC Fields-Valid Codes’.

### 5.1.7 Three-Part Offer Eligibility Declaration

If you intend to submit *dispatch data* for a resource requiring new day-ahead *offer* attributes for the three-part *offer* (*speed no load cost (SNL)* and *start up cost (SUC)*), you must submit a declaration. We will 'Enable' a flag as part of registration that will allow you to access the appropriate MPI/API submit/retrieve features. A 'Disabled' flag will allow you to submit/retrieve *offer* attributes using the template file solutions that exclude fields for *SNL* and *SUC*.

A declaration of three-part *offer* eligibility includes positive confirmation that you are a *registered market participant* that participates in the *real-time energy market*, and that you intend to submit three-part *energy offers.* We will record the Three-Part Offer Eligibility Declaration in our registration solution along with a start date in order to handle time dependent revisions.

A status change of the Day Ahead Offer Template Use Flag from 'Disabled' to 'Enabled' will be communicated to you by Market Entry. You will be instructed to use the *offer* template file version that allows for the submission of the day-ahead *offer* attributes.

### 5.1.8 Submit DACP Registration Data—Procedure

This procedure is initiated when a resource identified in 'Table 5-1: Applicability of Procedures' wants to participate in the DACP, and is required to submit new or revised registration information. This activity must be completed in advance of participation in DACP.

### 5.1.9 Work Flow for Submit DACP Registration Information

The diagrams in this section represent the flow of work and information related to the *market participant* activities associated with registering *facilities* for the day-ahead commitment process.

The meaning of the shapes in workflows is described in Table 5-3.

**Table 5-3: Workflow Diagram Legend**

| Legend | Description |
|---|---|
| Oval | An event that triggers task or that completes task. Trigger events and completion events are numbered sequentially within procedure (01 to 99) |
| Task Box | Shows reference number and task name or brief summary of task. Reference number (e.g., 1A.02) indicates procedure number within current *market manual* (1), sub-procedure identifier (if applicable) (A), and task number (02). |
| Solid Horizontal Line | Shows information flow between the *IESO* and external parties |
| Solid Vertical Line | Shows linkage between tasks |
| Broken Line | Links trigger events and completion events to preceding or succeeding task |

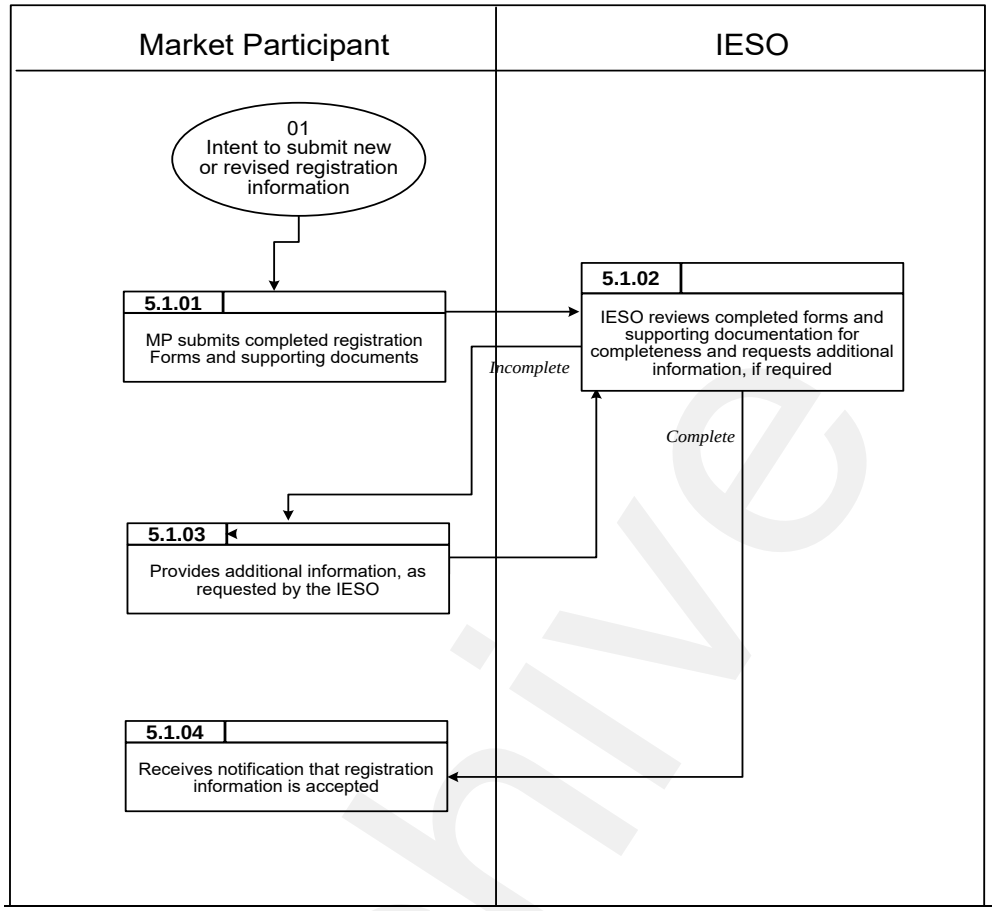



**Figure 5-2: Workflow for Submit DACP Registration Data**

## 5.1.10 Procedural Steps for Submit DACP Registration Data

This section contains detail on the steps for the submission of the registration data required to participate in the DACP.

The fields contained in the table of procedural steps are described in detail in 'Table 5-4: Procedural Steps Legend'.

**Table 5-4: Procedural Steps Legend**

| Legend | Description |
|---|---|
| Ref # | The numerical task reference. |
| Action | Detail about the specific task including:<br>• A description of the events that can trigger the start of the task<br>• A list of the information flows that may or must result from the task. |
| Tools | The format and method for each information flow. |

**Table 5-5: Procedural Steps for Submit DACP Registration Data**

| Ref # | Action | Tools |
|---|---|---|
| 01 | Download forms from *IESO* website (www.ieso.ca).<br>Compile DACP registration information:<br>• *Minimum loading point*<br>• *Minimum run-ti*me<br>• *Minimum generation block run-time*<br>• Elapsed time to *dispatch*<br>• Daily cascading Hydroelectric Dependency<br>• Quick start facilities<br>• Resource Name and Resource ID of the cascading hydroelectric dependent generation facility<br>• Primary and Secondary Fuel Type<br>• Three-part offer eligibility | • *IESO* website (www.ieso.ca)<br>• IMO-FORM-1552 "Real-Time Generation Cost Guarantee and Day-Ahead Production Cost Guarantee (RT-GCG and DA-PCG) Data Form "<br>• IMO-FORM-1181 "Facility Profile"<br>• IESO_FORM_1702 "Combined Cycle Plant Form"<br>• IMO-FORM-1004 "Generation Facilities"<br>• IESO_FORM_1721 " Implementation of Three-Part Offers" |
| 5.1.01 | Submit DACP registration information:<br>• IMO-FORM-1552 "Real-Time Generation Cost Guarantee and Day-Ahead Production Cost Guarantee (RT-GCG and DA-PCG) Data Form "<br>• IMO-FORM-1181 "Facility Profile"<br>• IESO_FORM_1702 "Combined Cycle Plant Form"<br>• IMO-FORM-1004 "Generation Facilities"<br>• IESO_FORM_1721 " Implementation of Three-Part Offers" | Email, mail, fax completed forms to IESO Registration & Compliance Support. |
| 5.1.02 | *IESO* reviews submitted forms for completeness, validates information and requests additional information if required | Email to *market participant* |
| 5.1.03 | *Market participant* submits additional information as requested by the *IESO* | Email to *IESO*: market.entry@ieso.ca |
| 5.1.03 | *IESO* issues notice that registration information is accepted | Email to *market participant* |
| 5.1.04 | *Market participant* receives notice that registration information is accepted and reviews registration information | *IESO* Facility Registration system |

## 5.2 Submit Combined Cycle Plant and Pseudo Unit Registration Data

This section does not apply to combined cycle plants (CCPs) which have physically aggregated resources.

In addition to any applicable registration requirements in section 5, CCPs have a requirement to submit data listed in sections 5.2.1 and 5.2.2. If you elect to utilize Pseudo Unit (PSU) modeling to schedule your CCP in the day-ahead you must further register the data specified in sections 5.2.3 and 5.2.4.

To de-register your *pseudo uni*t resources you must submit a written request to the *IESO*. De-registration must include all of the pseudo units resources at the *facility* (i.e., all of the PSUs associated with the CTs that share the same ST).

### 5.2.1 Combined Cycle Relationship Data

For registration purposes, you must provide the Resource Name and Resource ID of up to four physical combustion turbines (CT) and one physical steam turbine (ST), which make up the combined cycle plant. From this submission, the *IESO* will be able to derive relationships between the CT(s) and the ST and record their associations.

Combined cycle relationship data for CCPs not participating in PSU modeling will be used to ensure that ST constraints as a result of a DACP commitment are applied to the correct *MLP* amount based on the ST schedule and the scheduled configuration of associated CTs in the day-ahead.

If you intend to participate in PSU modeling, PSU resources will be created and their relationship to a CT and ST will be recorded. Each PSU will consist of one CT and its associated ST. The number of PSUs to be registered at a given CCP is equal to the number of CTs at the CCP.

Combined cycle relationship data for CCPs participating in PSU modeling will be used to:

- Calculate PSU DGD values from physical unit submissions
- Allocate physical unit derating and transmission limitations to the PSU level
- Translate the PSU day-ahead schedule to physical unit (PU) level
- Enable DA-PCG *settlement* of PSUs on the PU level

We will validate the data for all physical resources (CTs and ST) based on the following rules:

- Each resource has been registered individually
- Each resource is part of the same registered facility
- Each resource has a resource bid type of Dispatchable
- The resources are not a part of a physically aggregated resource
- All resources are under the operational control of a single *market participant*
- All resources are assessed a settlement under a single *metered market participant*

If you intend to participate in pseudo unit modeling as part of day-ahead scheduling of the combined cycle plant, further validation by the *IESO* (Registration & Compliance Support) includes:

- The number of PSUs registered is equal to the number of CTs registered to the combined cycle plant
- Each PSU will have a unique CT
- All CTs at a combined cycle plant that register as a PSU must share the same ST
- DA-PCG eligibility for each PSU resource will be based on physical CT unit registration data
- PSU market type participation (i.e., energy market, operating reserve markets) shall be identical to that of the physical CT unit registration data
- PSU administrative relationships (i.e., registered market participant, metered market participant, as well as RMP user eligibility to submit dispatch data) shall be identical to that of the physical CT unit registration data
- PSU Maximum Generator Capacity (PSU MGC) will be calculated and recorded based on the Maximum Generator Capacity of the CT and ST, and the parameter registered in 5.2.3 "Steam Turbine Percentage Share of Pseudo Unit". Computed parameters need to be rounded to the nearest single decimal value.
  PSU MGC = (ST Share% * ST MGC) + CT MGC
- PSU Maximum Ramp Rate will be calculated and recorded based on the sum of the Maximum Ramp Rate of the CT and ST.

## 5.2.2 Steam Turbine Minimum Loading Point

The *minimum loading point* of a steam turbine (ST) at a combined cycle plant may differ depending on the number of combustion turbines that obtain a schedule from the DACP. For registration purposes, *n*-1 additional ST MLPs are required for all combined cycle configurations above the *MLP* submitted for a 1 CT on 1 ST configuration; *n* is equal to the number of combustion turbines at the combined cycle plant. Each value must reflect the technical capability of the *generation unit*. In the day-ahead time frame, the additional registered ST MLPs will be used to validate Daily Generator Data submissions of ST MLPs.

The *IESO* (Registration & Compliance Support) will validate the submission based on the following validation rules:

- Must be a steam turbine part of a combined cycle plant
- Number format xxxx.x – unit is MW
- 0 < MLP(i-1)-on-1 < MLP(i)-on-1 =< MGC, and where 2 =< i =< n

In the above formula, "i" represents an index for the steam turbine MLP to indicate its relationship to the combined cycle plant configuration. The" i" is defined as a variable 2 =< i =< n, where n is the number of combustion turbines at the combined cycle plant.

### 5.2.3 Steam Turbine Percentage Share of a Pseudo Unit

Steam turbine percentage share of a PSU is the amount of steam turbine capacity associated with each PSU, expressed as a percentage. For the purpose of registration, the number of share percentage values to be submitted by the *market participant* is equal to the number of combustion turbine resources in the combined cycle plant that is being registered.

The values are captured only if you intend to use pseudo unit modeling and must reflect the technical capability of the *generation unit*. The registered ST Percentage Share of a PSU value will be used to calculate the Maximum Generator Capacity (MGC) and Duct Firing Operating Region of a Pseudo Unit.

The data will be validated by the *IESO* (Registration & Compliance Support) on submission based on the following validation rules, which are mandatory for all pseudo units:

- Number of share percentage values provided must equal the number of combustion turbine resources in the combined cycle plant that is being registered for pseudo unit modeling
- Each value must have number format xxx.x%
- Each value must be a non-negative value
- Each value (of ST Share %) multiplied by the ST MGC must be greater or equal to the ST MLP1-on-1:

  ST Share % * ST MGC >= ST MLP1-on-1
- Sum of all share percentages must equal 100.0%

### 5.2.4 Steam Turbine Duct Firing Capacity

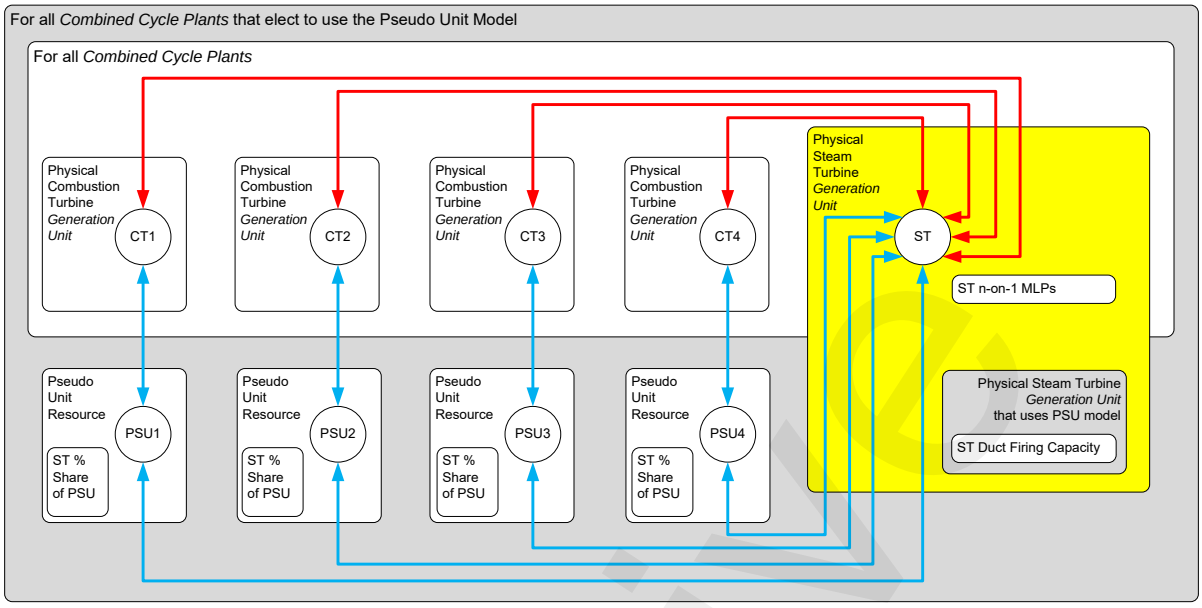
Duct firing capacity is the capacity available from the duct firing of a physical steam turbine. For registration purposes, a single value of duct firing capacity will be provided and captured for a steam turbine resource associated with a combined cycle plant that has indicated the desire to use pseudo unit modeling.

The value must reflect the technical capability of the *generation unit*. The registered ST duct firing capacity value will be used to calculate the duct firing operating region of a pseudo unit.

The data will be validated by the *IESO* (Registration & Compliance Support) on submission based on the following validation rules:

- Must be a steam turbine from a combined cycle plant
- Number format xxxx.x – unit is MW
- 0 =< Duct Firing =< ST MGC – [ (Registered Number of Combustion Turbines at a Combined cycle plant) * (Registered ST MLP1-on-1) ]

The combined cycle plant relationships and registration requirements in sections 5.2.1 to 5.2.4 are shown in Figure 5 3:




Legend: *Combined cycle plants* require all "**red line**" relationships shown to be established.
*Combined cycle plants* that elect to use the pseudo unit model require all "**red line**" and "**blue line**" relationships shown to be established.

**Figure 5-3: Combined Cycle Plant Relationships and Registration Requirements**

## 5.2.5 Submit Combined Cycle Plant and Pseudo Unit Registration Information—Procedure

This procedure is initiated when a combined cycle plant wishes to participate in the DACP and is required to submit new or revised registration information. Additional registration information is required for those combined cycle plants that wish to be modelled as a pseudo unit in the DACP. This activity must be completed in advance of participation in the DACP.

### 5.2.6 Work Flow for Submit Combined Cycle Plant and Pseudo Unit Registration Information

The diagrams in this section represent the flow of work and information related to the *market participant* activities associated with registering *facilities* for the day-ahead commitment process.

See 'Table 5-3: Workflow Diagram Legend' for the meaning of the flowchart shapes.

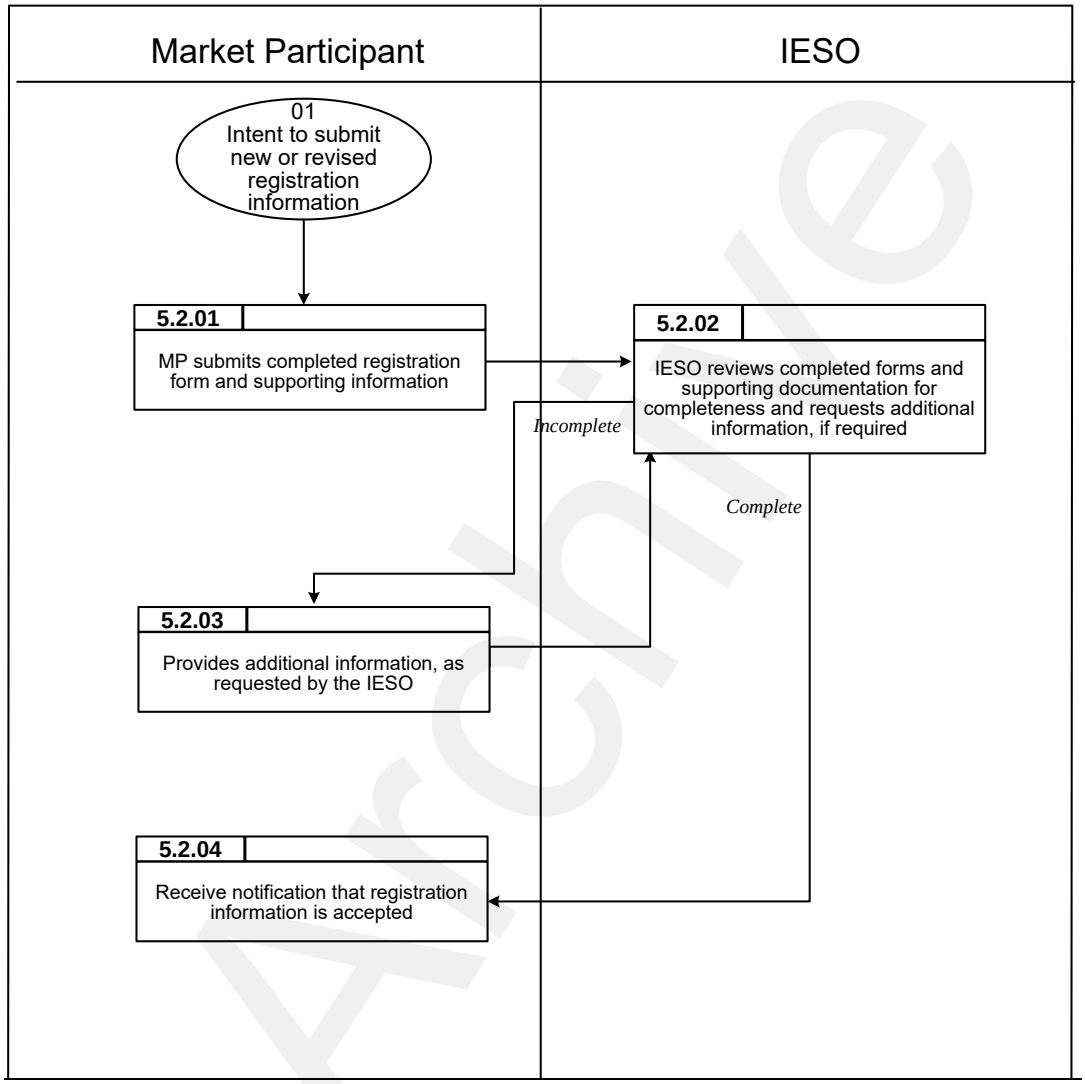



**Figure 5-4: Workflow for Submit Combined Cycle Plant and Pseudo Unit Registration Data**

### 5.2.7 Procedural Steps for Submit Combined Cycle Plant and Pseudo Unit Registration Data

This section contains details on the steps for the submission of *dispatch data* and revisions with or without restriction in the real-time *energy* and *operating reserve markets*.

The fields contained in the table of procedural steps are described in detail in 'Table 5-4: Procedural Steps Legend'.

**Table 5-6: Procedural Steps for Submit Combined Cycle Plant and Pseudo Unit Registration Data**

| Ref # | Action | Tools |
|---|---|---|
| 01 | Compile DACP registration information and download form from *IESO* website.<br>For all CCP *Generation Units*:<br>• Resource Name and Resource ID of all physical combustion turbines (CT) and one physical steam turbine (ST)<br>For Pseudo Unit Modeling:<br>• ST Percentage Share (for each PSU)<br>• ST Duct Firing Capacity | • *IESO* website (www.ieso.ca)<br>• IMO-FORM-1702 "Combined Cycle Plant Form" |
| 5.2.01 | Submit DACP registration information:<br>• IMO-FORM-1702 "Combined Cycle Plant Form" | Email completed forms to: market.entry@ieso.ca |
| 5.2.02 | *IESO* reviews submitted form for completeness, validates information and requests additional information if required | Email to *market participant* |
| 5.2.03 | You submit additional information as requested by the *IESO* | Email to *IESO*: market.entry@ieso.ca |
| 5.2.04 | *IESO* issues notice that registration information is accepted | Email to *market participant* |
| 5.2.05 | You receive notice that registration information is accepted and you review the registration information | Facility Registration system |

**– End of Section –**

# Appendix A: Registration Forms

The forms used in this procedure can be found on the *IESO* website (www.ieso.ca).

**– End of Document –**